

ADULT LITERACY CLASS SETTINGS
AND STUDENT ACHIEVEMENT AND ATTENDANCE IN JAMAICA

By

WILLIAM BENET

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By

William Benét

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The purpose of the research was to determine whether several types of settings in which adult evening literacy classes are commonly held in northern Trelawny Parish, Jamaica, are differentially associated with student achievement and attendance. These settings were classified by their primary social function and included private homes, churches, and primary schools. The underlying assumption of the research was that literacy classes held in settings suggestive of teaching children, such as primary schools, may prove threatening enough to many adults to adversely affect achievement and attendance; whereas classes held in comparatively adult settings, such as private homes and churches, may have a supportive influence.

A randomly selected sample of classes in each setting was obtained. The sample was distributed across 12 towns and villages and included seven classes held in private homes with an enrollment of 79 students, five classes held in churches with an enrollment of 82 students, and five classes held in

primary schools with an enrollment of 101 students. Teacher training, class instruction, and student testing were supervised by the Jamaican Movement for the Advancement of Literacy (JAMAL) Foundation.

Achievement was measured as the mean number of months of instruction that students needed to advance one level of instruction in a four level sequence, and attendance was measured as the proportion of students who were enrolled and regularly attending classes. Measures of both these variables were obtained for each setting by student sex, and, in the case of student attendance, by student enrollment level and teacher sex. Analysis of variance was used to test whether class setting and selected interactions were related to student achievement and attendance. Regression analysis and analysis of covariance were used as supplementary procedures to identify and control additional variables associated with student, teacher, and class differences among settings.

The results of the research revealed that class setting was related to student months per level of instruction beyond the .001 level of significance using both analysis of variance and analysis of covariance. Post hoc tests of pairwise comparisons showed that students attending classes held in private homes advanced more rapidly in instructional level than students attending classes held in primary schools, while differences for students attending classes held in churches were equivocal. Class setting accounted for 9.9% of the proportion of variance in achievement using analysis of variance, and 10.9% using

analysis of covariance. No significant interaction between class setting and student sex was found with either procedure.

The results of the research also revealed that class setting was related to student attendance beyond the .05 level of significance. A post hoc test of pairwise comparisons showed that attendance was significantly higher in classes held in private homes and churches than in primary schools. However, class setting accounted for only 5.1% of the proportion of variance in attendance. There were no significant interactions between class setting and student sex, student enrollment level, and teacher sex, or higher order interactions of these variables.

The results of the research suggest increasing the use of private homes and churches as venues for literacy instruction in northern Trelawny Parish. However, the results were not sufficient to warrant discontinuing the use of primary schools. Although student achievement and attendance were generally higher in classes held in adult settings than in settings suggestive of teaching children, additional research is needed to explain whether the relationship may have been due to other factors. Until further research is done, students probably should be given a choice among several types of class settings.

CHAPTER I

INTRODUCTION

Statement of the Problem

In Latin America and the Caribbean illiteracy has been variously conceived of as both the cause and effect of miseria (Galat-Noumer, 1969) and as an obstacle to the release and full utilization of human resources for economic and social development (Gale, 1969; Hart, 1965; Manley, 1972). Adult illiteracy rates for developed and developing countries worldwide are estimated at 3.5% and 50.2% respectively (UNESCO, 1972). Adult illiteracy in Latin America and the Caribbean is estimated at 30.2%, but nearly one third of the countries in the Americas, including Jamaica, have rates that exceed 40% (América en Cifras, 1973; National Literacy Board, 1974). Although the problem has been surveyed with increasing frequency, relatively little research has been conducted to upgrade program planning and evaluation, which are essential to combating illiteracy (Benét, Uquillas, & Renner, 1975; Marquardt & Cortright, 1968). Consequently, there is a need in the region not only for vigorous literacy activities, but in particular for research that can be used immediately to increase the effectiveness of existing literacy programs.

The purpose of the present research was to determine whether several types of settings in which adult evening

literacy classes are commonly held in northern Trelawny Parish, Jamaica, are differentially associated with literacy achievement and attendance. These settings were differentiated by their primary social function and included private homes, churches and church halls, and primary schools. The research attempted to establish criteria for planning and selecting the most effective settings in which to hold adult literacy classes and provide a basis for evaluating the relative efficacy of these settings.

Little is known about the kind of setting that is most appropriate for holding adult literacy classes. In many countries classes are held wherever space is available, often in public primary schools and churches. However, in recent years there has been a tendency to hold literacy classes in work-oriented settings such as factories, shops, and military installations. Implied in this shift is the notion that adults would feel more comfortable and respond more favorably to instruction in settings that are distinctly adult. Yet the tradition of teaching adult illiterates as though they were children has continued in many places. The practice of holding classes in settings that are suggestive of teaching children, such as primary schools, may prove threatening enough to many adults to adversely affect literacy achievement and attendance; whereas other types of settings, such as private homes or churches, may have a neutral or even supportive influence.

Review of Selected Literature

In recent years research on learning and behavior related to learning has increasingly included the study of the effects of the physical and social environment of instructional settings. Differences in learning have been found which are related to the environment and to the interaction between the environment and cognitive, affective, physical, and socioeconomic differences among students.

Physical Environment

With the establishment of the Educational Facilities Laboratory in New York in 1958, an increasing amount of research has been conducted on the effects of selected aspects of the physical environment on learning. Research reviewed or reported by Larson (1965a, 1965b), McVey (1971), and the University of Wisconsin Environmental Design Center (1970) indicates that sensory factors in the classroom environment affect the comfort, development, and academic performance of students. This research has mainly dealt with the visual, sonic, thermal, and spatial aspects of the environment as well as the structural and stylistic design of facilities.

With regard to the effect of the general physical environment on learning, Abernathy (1940) and Bilodeau and Schlosberg (1959) found that changes in class setting adversely affected recall in adults. A well known study by Maslow and Mintz (1956) suggested that the aesthetic qualities of a room differentially influence the perception of certain personality

characteristics in others. Michelson (1968) found that student achievement varied directly with the physical quality of the study environment, and Brembeck (1972) noted that the physical and social context of formal and nonformal education settings may be an important determinant of the kind of learning that takes place. A study by Harris (1972) also revealed that the location of adult literacy classes may be an important determinant of attendance. Haase and DiMattia (1972) found that physical classroom size was positively related to verbal learning in adults, while Nicholson and Otto (1967) found that student class size in adult literacy classes was negatively related to attendance. The effect of the spatial environment on a wide range of behavior also has been established and reviewed by Hall (1966) and Sommer (1969). White (1972) stressed that even such aspects as seating capacity should be considered since an overly large room with empty seating could convey the impression of a lack of student interest or motivation. She also suggested that adults should have a choice of settings and surroundings in which to learn, adding that physical surroundings may affect the way students attend to their tasks by as much as 25%. However, Larson (1965a) and White agreed that there was still a notable lack of information about the effect of the physical environment on learning, while Thomas and Wright (1975) contended that the significance of the physical environment has been overlooked by many educators.

Social Environment

The importance of the immediate psychological environment on learning has been recognized by learning theory. Field psychology (Lewin, 1951) has referred to the psychological environment, or milieu, that characterizes a situation and influences perception, motivation, and learning. Travers (1963) stated that although the environmental stimuli which produce affective responses are relevant and important to motivation and learning, knowledge of this effect is still vague, and there may be other relatively obscure variables that are influential. Nevertheless, learning occurs in a social context and the influence of interpersonal relationships undoubtedly plays a role in facilitating or inhibiting learning (Knowles, 1973; Travers, 1963).

Other theorists have emphasized the importance of the self-concept on behavior in different social contexts. Rogers (1947), Maslow (1954), and Combs (1962) have studied the relationship between the social environment and development of the self-concept and its effect on learning and concur that an adequate self-concept enhances performance. A review of the literature by McClusky (1965) on adult psychology indicated the importance of the self-concept on learning in older adults, while Boshier (1972) noted its importance on adult class attendance. In addition, White (1972) contended that one of the major problems in adult education with regard to class setting is that adult education classes too often are held in institutions which are not primarily associated with adult activities.

She suggested that the social and psychological implications of these settings need to be considered, and that facilities for adults should reflect the intent of adult education meetings in order to contribute to the adult's ease, confidence, and sense of capability.

With regard to further research on the social environment, a review by Jensen and Schrader (1965) indicated that the influence of the social environment on adult socialization, in terms of such factors as perception, attitudes, and social skills, is important to participation in different types of organizational settings, including educational settings. Thornberg (1975) also found that student attitude toward school may be an important determinant of attendance, while Boshier (1973) suggested that adult student attendance may be due to the interaction of both internal psychological and external environmental variables. A study by Fox, Lippitt, and Schmuck (1964) explored the social and psychological factors of a productive learning environment. The findings revealed that students who had a positive attitude toward class utilized their ability more than those who were less attracted to class, and the extent to which they utilized their ability was directly related to their perceived sociometric status. Perceived sociometric status, however, was also found to be positively related to attitude toward both self and school. Fox (1965) also reviewed the influence of a number of variables on student learning and attitude toward school, including student-teacher and peer group relations, self-concept, and socioeconomic status,

and concluded that a supportive social climate is necessary to maximize learning, although certain variables such as intelligence, age, and, in some instances, sex may interact with the social environment in relation to learning.

The need for further research regarding the effects of instructional settings on learning and learning-related behavior is indicated and would be particularly useful in adult literacy education. The need is especially great in Latin America and the Caribbean where, despite the efforts that are being made to combat illiteracy, research on adult instructional settings is conspicuously lacking. UNESCO (1968) has suggested that a study be conducted to determine to what extent class settings affect reading habits, and the Experimental World Literacy Programme (UNESCO, 1970) has cited, as one of several priority research topics, the need to determine the most appropriate settings in which to hold literacy classes, but to date the topic has been largely uninvestigated.

Variables

Adult literacy education in Jamaica is supervised by the Jamaican Movement for the Advancement of Literacy (JAMAL) Foundation. Instruction is offered in evening classes, which include the majority of literacy classes, adult education day center classes, mobile road-side classes, and government and private sector in-house classes.

The principal independent variable of the research was the

setting in which JAMAL evening classes are held in northern Trelawny Parish. This consisted of settings differentiated by their primary social function and characterized as distinctly adult settings and settings suggestive of teaching children. Classes held in private homes and churches or church halls characterized adult settings; and classes held in primary schools characterized settings suggestive of teaching children. The majority of JAMAL evening classes in northern Trelawny Parish, as well as in the rest of Jamaica, are held in these three types of establishments, although a small number of evening classes are held in community centers and other facilities.

Additional independent variables included student and teacher sex and student placement level. Student placement level consisted of the instructional level (1-4) to which each student is assigned at enrollment based upon an informal teacher assessment. These variables were selected to provide information that would be indispensable to program planning, particularly if they were found to interact with class setting. Covariate adjustment of selected concomitant variables was also utilized as a supplementary procedure in some instances to clarify the effect of the independent variables and is described in Chapter II.

The dependent variables of the research were student literacy achievement and attendance. Achievement was measured as the mean number of months per level of instruction that students needed to pass a periodically administered JAMAL

literacy examination qualifying them to advance from their initial level of instruction to a higher level. A preliminary survey indicated that most of the students currently enrolled had advanced one or more levels, and of those that had not, the majority included students enrolled three or fewer months. Measures were made, therefore, only of those students who had advanced at least one level in order to avoid obtaining spurious measures of students who had been in the program a short while and consequently may have not had the opportunity to take the advancement examination. This procedure also minimized the risk of obtaining equally spurious measures of students who had failed to take the advancement examination due to absence.

Attendance was measured as the proportion of students who were enrolled and regularly attending classes. Enrollment and attendance criteria were the same as those used by the JAMAL teacher trainer in northern Trelawny Parish. Students were considered enrolled in class until they had been absent more than three consecutive months, and regularly attending until they had been absent more than three consecutive weeks. The JAMAL program and the measurement instruments used in the research are described in Chapter II.

Hypotheses

The following operational null hypotheses were formulated to test whether a relationship exists between the principal

independent variable and the dependent variables:

1. There is no relationship between the type of setting in which JAMAL evening classes are held in northern Trelawny Parish and the mean months of instruction that students need to advance from their initial level of instruction to a higher level.
2. There is no relationship between the type of setting in which JAMAL evening classes are held in northern Trelawny Parish and the proportions of students regularly attending classes.

In addition, corollary tests were planned to determine whether student sex interacts with class setting in relation to achievement and attendance, and whether both student placement level and student and teacher sex interact with class setting in relation to attendance.

CHAPTER II

METHOD

Field Setting

This section includes a brief description of the general characteristics of the field setting that should be considered in replicating the research and generalizing the findings to other field settings.

Background

The Government of Jamaica has recognized that illiteracy is "a grave and fundamental problem in Jamaican life" (Manley, 1972, p. 1), although it was not until 1962 that the extent of the problem was fully perceived. The 1943 census reported that 23.6% of the population ten years of age and over were illiterate, and the 1960 census reported that 15.1% were illiterate (Statistical Yearbook, 1975). In neither census, however, were the respondents required to demonstrate that they possessed any reading, writing, or computational skills. It was apparent that illiteracy was more pervasive than either census had indicated and plans were made to conduct a more reliable survey. In 1962 the Social Development Commission in collaboration with the Department of Statistics and the Institute of Social and Economic Research of the University of the West Indies conducted a cluster survey of randomly selected areas

in the island and found that 42.9% of the respondents 15 years of age and over were functionally illiterate. In 1970 the Government, with the assistance of UNESCO, established the Literacy Evaluation and Planning Committee, which estimated that 40-50% of the population 14 years of age and over were functionally illiterate (Gammon, 1975).

Literacy work in Jamaica extends back to 1943 when a campaign employing the Laubach method ("Each one teach one") was organized. It had limited impact, and after two or three years it was abandoned (Gammon, 1975). In 1951 adult literacy education was undertaken by the Government through the Social Development Commission. In June 1972 the Government realized the need for establishing a separate literacy authority, noting that "the attack on the illiteracy problem, commencing officially in 1951, has so far been miniscule" (Manley, 1972, p. 1). And it declared that "the Government, therefore, intends to make literacy a national priority and to launch a vigorous and massive attack on illiteracy . . . aimed at eradicating illiteracy in 4 years" (Manley, 1972, p. 1). In September 1972 the National Literacy Programme was established, and in November 1974, after its administrative structure was reorganized, it became the Jamaican Movement for the Advancement of Literacy Foundation (JAMAL, 1975; National Literacy Board, 1974).

JAMAL

The JAMAL Foundation is administered by a Board of Directors and an executive staff consisting of an executive director and

eight assistant directors with departmental responsibilities. The program operates in 14 zones which are coterminous with the geographical parishes. The zones are further subdivided into 53 areas which are coterminous with the parish constituencies. The zones and areas are managed by the Field Operations Department through a field staff of zone officers, area officers, and assistant area officers who liaise with voluntary committees comprised of local community leaders and residents. The zone and area officers are responsible for enrolling students, enlisting volunteer teachers, and soliciting and obtaining classroom facilities. The committees are especially active in generating support and raising funds in their respective zones and areas. Teacher training, media, and materials production are managed by the Technical Services Department. Supportive services are provided by the Departments of Communications, Administration, Finance, Evaluation and Research, Special Projects, and Fund-Raising.

In March 1975 JAMAL reported that 2,969 evening classes, 820 adult education day center classes, and 44 government and private sector in-house classes were in operation with 47,736 students currently enrolled and 34,713 (73%) regularly attending (JAMAL, 1975). These statistics, however, were not verified by the Evaluation and Research Department and should probably be regarded as estimates of the actual population parameters. Evening classes usually meet two hours, two or three days a week, and adult education day center classes, three three-hour periods, five days a week.

Evening class teachers serve on a voluntary basis, although they receive an emolument of J\$10.00 (US\$11.00) per month to cover travel and incidental expenses. Teachers are given a uniform methods course in instructional techniques, curriculum materials, and objectives. The course ranges in length from 12 to 20 hours depending on the individual teacher's academic level and experience, and is followed by occasional seminars and conferences. Adult education day center classes are supervised by professional JAMAL staff who are assisted by volunteer teachers and National Youth Service volunteers.

Instruction is provided on four levels. New enrollees are informally assessed by their teachers and placed in a level commensurate with their ability. The instructional emphasis is on reading, although writing and computational skills and a variety of objectives covering citizenship, consumer education, home and family life, and nutrition are included in the syllabus (JAMAL, 1973). After initial placement students are required to pass an objective literacy examination administered by the area teacher trainer in order to advance to the next level. Those students who complete level four are then encouraged to take a nationally administered literacy achievement examination. Although this examination is not compulsory, only those students who pass it are awarded literacy certificates. From July 1974 to March 1975 approximately 20,500 students had reportedly attained level four proficiency; of these, only 2,500 (12%) had taken the literacy achievement examination; and of

these, 1,687 (68%) passed or 8% of those who completed level four (JAMAL, 1975).

Trelawny Parish

The organization and administration of JAMAL in Trelawny Parish is similar to other parishes. The program is promoted vigorously in the parish and, in general, the Field Operations and Technical Services staff are dedicated. The number and percentage of illiterates in the parish, however, are not known and consequently the success of the program in reducing the rate of illiteracy could not be determined, although increasing numbers of illiterates have been enrolling in JAMAL classes yearly.

The demographic, economic, and educational characteristics of Trelawny Parish are also typical to some extent of Jamaica's other parishes, and as an integral part of the field setting require a brief description.

Trelawny Parish is located on the northwest coast of the island in the county of Cornwall. The parish capital, Falmouth, is situated on the coast 23 miles east of the resort city of Montego Bay, the parish capital of St. James, and 100 miles northwest of Kingston, the national capital. The area of the parish is approximately evenly divided into a northern coastal constituency and a southern inland constituency which overlaps the remote and partially unexplored cockpit country of Jamaica's northwest interior.

Although approximately 67% of the parish's population of more than 61,200 live in the northern constituency, Trelawny is one of Jamaica's more sparsely populated parishes with an area of 337.65 square miles and a density of 179 persons per square mile. Approximately 87% of the population are classified as rural, and of the more than 7,600 that are classified as urban, more than 3,900 live in Falmouth (1970 census).

Agriculture, which includes sugar cane and coconuts grown on the coast and coffee and a variety of other crops grown in the mountainous interior, is the major industry in the parish. Most of the farming is done on approximately two dozen estates averaging 2,600 acres each, although 9,054 of the parish's 10,829 farms, or nearly 84%, average less than one and one-half acres each (Statistical Yearbook, 1975).

Employment in the parish is seasonal, and unemployment figures were not available. Nationwide, however, unemployment is conservatively estimated in excess of 20%. Parish data on per capita income were also not available, but the latest island-wide survey indicated that 58% of the population earned less than J\$10.00 (US\$11.00) per week, and nearly 77% less than J\$20.00 (US\$22.00) per week (Statistical Yearbook, 1975). Double-digit inflation in recent years and the island's heavy dependence on increasingly expensive imported goods have escalated the cost of living, so that throughout the island, and particularly in urban areas, there is acute poverty. This has led many illiterates, particularly young ones, to regard the national literacy program as an opportunity to acquire

skills leading to regular employment and a higher level of income.

The population of Trelawny Parish is young, with 56% less than 20 years of age and 66% less than 30. The latest survey indicated that 68% of the population (including persons still in school) had received only primary schooling, and nearly 21% had never attended school. Moreover, the rate of attendance in primary schools was only 63%, although primary education is free and, in theory, compulsory (Statistical Yearbook, 1975).

Population and Sample

The research population was originally delimited to students enrolled in JAMAL evening classes in Trelawny Parish and, subsequently, delimited to students enrolled in evening classes in the northern constituency of the parish due to the greater accessibility of these classes and the necessity of completing the field research within a predetermined time limit. When the research began, complete and accurate records of the location, type of setting, and number of classes in Trelawny Parish, including the number of students enrolled and attending, were unavailable. Records for the other 13 parishes were also incomplete, and JAMAL has since made the collecting of this information a priority of its Evaluation and Research Department. However, it was necessary in the initial stage of the research to obtain an overview of some of the parameters of the population before a sampling procedure could be designed. For this purpose, a class data record form was constructed

(Appendix A) and administered with the assistance of the northern area teacher trainer to each JAMAL evening class in northern Trelawny Parish between November and December 1975.

Seventy-five evening classes held in 30 private homes, 23 churches and church halls, 14 primary schools, and 8 community centers and other settings distributed in 40 towns and villages with an enrollment of 1,205 students, were recorded. The last category, community centers and other settings, was not germane to the research and was omitted from further analysis. In the other three categories, 334 students were enrolled in classes held in private homes, 416 were enrolled in classes held in churches and church halls, and 275 were enrolled in classes held in primary schools.

Some classes, usually large ones, had one or more assistant teachers which yielded a teacher-student ratio of approximately 1:8 in private homes and churches and 1:9 in primary schools. Although the large majority of teachers-in-charge (48 of 67) were female, each setting included male teachers. In all three settings classes usually met two or three days a week on weekdays from 7:00 PM to 9:00 PM, and students were expected to attend every session. The mean number of hours per week of class instruction in each setting was 5.17 hours in private homes, 4.61 hours in churches, and 4.93 in primary schools.

A supplementary class data record form was subsequently constructed (Appendix B) and administered with the assistance of the northern area teacher trainer to a randomly selected

sample of classes in each setting between February and March 1976 in order to obtain measures of both student months per level of instruction and rates of attendance for male and female students.

A sufficient number of classes were chosen to insure that randomly selected subsamples of N students could be obtained to test the relationship between the principal independent and dependent variables at the .05 level of significance (the probability of rejecting the null hypothesis when it is true) with power equal to .80 (the probability of rejecting the null hypothesis when it is false), given an anticipated effect size equal to or greater than .25 standard deviations of the standardized population means. The procedures that were used to determine sample size and power are described by Cohen (1969). The sample included seven classes held in private homes with an enrollment of 79 students, five held in churches and church halls with an enrollment of 82 students, and five held in primary schools with an enrollment of 101 students distributed in 12 towns and villages.

Teacher-student ratios, the proportions of male and female teachers, and the number of hours per week that classes met were predictably similar to the population parameters described above. Mean student placement levels in the various class settings were 1.56, 1.65, and 1.76 in private homes, churches, and primary schools respectively with little variation between males and females. Student ages were not recorded and this information was not included in the records that the

teachers kept on the students. JAMAL had previously conducted an island-wide survey designed in part to obtain this information and found that most illiterates were adamantly reluctant to divulge their ages. However, it was apparent that the sample of students included in the present research ranged in age from approximately 15 years to 60 years or older and that the mean age was between 30 and 45. Mean teacher educational levels (i.e. years of schooling of the teachers-in-charge) were 7.43, 6.40, and 7.60 in private homes, churches, and primary schools respectively. Tables of means and standard deviations of student months per level of instruction and student rates of attendance are presented with accompanying factorial and covariate analyses in Chapter III.

With regard to the physical and social characteristics of the various class settings, there were a number of salient differences as well as some degree of commonality both between and within settings. Classes were typically held in rooms ranging from 150 square feet in private homes to 800 square feet in churches and primary schools. Lighting and ventilation were adequate in most instances and every student had a chair or desk at which to work.

Classes in private homes were held either in the living room with students seated in a semicircle or, occasionally, on the porch. Chairs and, in some instances, desks provided by JAMAL were available for the students. Classes in churches and primary schools were usually held in a principal room with

students seated at benches or, in the case of primary schools, in standard pupil desk-chairs arranged in rows and columns.

In all three types of settings, students were usually grouped regardless of level, although instructional provisions were made for students of different levels. There were four classes in the sample that had students working at two different levels, nine that had students working at three different levels, and four that had students working at four different levels. Consequently, there was little reason for students to feel that some classes were more advanced than others on the basis of differences in the level of instruction.

Teacher-student relations appeared to be more informal and relaxed in private home classes than in church and primary school classes. In many private home classes, the teacher often knew each student personally and many students came to class to socialize as much as to learn. On the other hand, particularly in primary school classes, an atmosphere of formality was often maintained which included students having to stand when reciting lessons or when the teacher or a JAMAL staff officer entered or left the room, giving the impression that the deference that was expected of primary school pupils toward their teachers was also expected of adult students.

In summary, several points regarding the sampling procedure should be noted. The procedure consisted of randomly selecting a sample of classes from each of the various settings, and then randomly selecting subsamples of students for statistical analysis. Hence, there were two parent populations: the

population of classes in northern Trelawny Parish and the population of students enrolled in the cluster sample of classes. Consequently, the use of the student as the unit of analysis may tend to be biased if statistical inferences are made beyond the cluster population of students to the total population of students since the unit of randomization was the class and not the individual student. An empirical study by Frankel (1971), however, suggests that the degree of bias may be slight. Non-independence of student responses was also less of an issue in the research than it would have been in research conducted with intact public school classes where students were required to remain in the classes to which they had been assigned. In this instance, it is less clear whether to use the student or the class mean as the unit of statistical analysis (Fletcher, 1968; Peckham, Glass, & Hopkins, 1969). Despite the conceptual and, in some instances, the practical desirability of using the student as the unit of both analysis and inference, it was considered prudent to also analyze class means as an ancillary source of information.

Design

Achievement

Observations of student months per level of instruction were classified by class setting and student sex in a 3×2 factorial design and analyzed by analysis of variance. Covariate analysis was used as a supplementary procedure to

clarify the relationship between the independent and dependent variables (cf. Snedecor & Cochran, 1967).

Data on a selected number of concomitant variables were obtained from the supplementary class record form. Although these variables were irrelevant to the objectives of the research, they were identified as sources of variance that may be systematically related to the dependent variable. The concomitant variables were student enrollment level, student rate of attendance, teacher educational level, and class hours per week of instruction. The regression of student months per level of instruction on these variables within each setting was computed and tested for interaction. Intragroup correlations were then computed and evaluated to determine whether to use covariate adjustment.

It could not be assumed that the independent and concomitant variables were independently related to student months per level of instruction. For example, any differences in the dependent variable among settings may also have been due to differences in class hours per week of instruction. However, class hours per week of instruction may have been in turn a function of class setting, that is, teachers may have systematically held classes longer in their homes than in churches or primary schools due to the social nature of the setting and perhaps the convenience of not having had to commute to class. If covariate analysis were used solely in this instance, it would control not only the effect of hours of instruction but the effect of the setting as well. As a supplementary procedure,

however, covariate analysis could provide additional information regarding the relationship between student months per level of instruction and class setting that neither analysis of variance nor covariate analysis could have done alone.

Attendance

Observations of student attendance were classified by (a) class setting, student sex, and student placement level and (b) class setting, student sex, and teacher sex in two $3 \times 2 \times 2$ factorial designs.

Attendance was measured as a dichotomous variable (zero-one) and analyzed by analysis of variance. Lunney (1970) has shown that this procedure can be used in fixed-effects models instead of the usual chi-square test when the number of observations per level of classification is equal and there are at least 20 degrees of freedom for error (or 40 df if the proportion of responses in any cell is less than .20). This procedure is reportedly robust with respect to Type I error and power and provides accurate estimates of the total proportion of variance (omega-square) between the various independent variables and the dependent variable.

The use of this procedure with covariate adjustment was not investigated by Lunney and, therefore, was not used as a supplementary procedure with student attendance. However, there was no compelling reason to suspect that the concomitant variables identified with student months per level of instruction were substantially or even moderately related to student attendance.

Although each of the three settings served as a control group for the other two, the research was restricted to testing associational rather than causal hypotheses since it was not administratively possible to assign students randomly to classes in the various settings to achieve experimentally equivalent control groups. Nevertheless, the results of the research were relevant to causal hypotheses inasmuch as the failure to detect a significant relationship would imply the lack of causality.

The assumptions of normally distributed populations having equal variances which underly the tests of significance used in the research were examined only insofar as it was evident that failure to sustain them threatened to bias the tests. The robustness of analysis of variance is generally well known. Skewness and kurtosis ordinarily have little effect on Type I and Type II error, except in the case of kurtosis when n is small. Heterogeneous variances also have little effect on Type I error (the effect on power is a moot issue) except when group n 's are unequal (Glass, Peckham, & Sanders, 1972). Accordingly, tests of these assumptions were omitted, except in instances of unequal n when group variances were tested for homogeneity.

With regard to the data processing procedures used in the research, the analyses were done at the Northeast Regional Data Center of the University of Florida on an IBM System/370-165 computer using the BMD statistical package (Dixon, 1973) and FORTRAN programs written by the researcher.

Instruments

The use of student months per level of instruction as a meaningful measure of achievement required two things: firstly, the reliability of the JAMAL Adult Literacy Education Test, which was used to promote students from one instructional level to another, had to be determined and found to be sufficiently high. Secondly, the readability of the readers used in each of the four levels of instruction had to be estimated and found to correspond with the level at which they were used. If the readers were found to be approximately the same level of difficulty or if they varied in difficulty in the wrong direction (e.g. level two readers showing greater difficulty than level four readers), then the use of months per level of instruction might be a spurious measure of achievement.

The JAMAL Adult Literacy Education Test actually consisted of four separate tests (Appendix C) corresponding to each level of instruction. Each test included reading, writing, and arithmetic sections of varying length. When students completed the reading program for their respective level, they were required to take the test corresponding to the level they had completed and achieve a score of 50% or higher to advance to the next level of instruction. The JAMAL teacher trainer in northern Trelawny Parish visited each class periodically to administer the test, and students who failed could retake it after further study. When the research began, the reliability of the test was unknown. However, with the cooperation of the JAMAL area

teacher trainer, student tests were obtained for each level and the split-half reliability and the Spearman-Brown correction for the whole test reliability of each test was determined. The corrected reliabilities were Level 1: $\underline{r} = .98$, Level 2: $\underline{r} = .65$, Level 3: $\underline{r} = .65$, and Level 4: $\underline{r} = .92$. The reliabilities for Levels 2 and 3 were low for this kind of test, but not unacceptable for the purposes of the research.

During the research, JAMAL conducted an island-wide pilot project to determine whether the Place-ABLE reading test, published in 1968 by Harcourt, Brace, & World, could be revised and adapted for local use as a single form, multilevel reading test. The test, which consisted of 27 multiple-choice questions of increasing difficulty, was administered between October and December 1975 to 104 students enrolled in 11 private home, church, and primary school classes distributed in 10 towns and villages in northern Trelawny Parish. The Spearman-Brown corrected split-half reliability of the test was $\underline{r} = .88$. This provided an opportunity to analyze the derived validity of each of the JAMAL tests by computing the correlation between student instructional level and Place-ABLE score. Dual measures were obtained for 90 students and the Pearson product-moment correlation was computed. A correction for the reliability of both instruments described by Thorndike and Hagen (1955) was made which yielded $\underline{r} = .61$. Considering that the JAMAL tests measured writing and arithmetic skills as well as reading, the correlation between student instructional level and the Place-ABLE reading test was quite high and provided mutual support of the meaningfulness of both tests.

The reading material used in the JAMAL program is described in Appendix D. JAMAL had made a readability analysis of the primary readers, but not the supplementary readers. An analysis of the readability of both sets of readers was therefore made using the Dale-Chall Formula (1948):

$$\hat{Y} = .1579X_1 + .0496X_2 + 3.6365$$

where \hat{Y} = the unconverted reading grade score of a student who can answer one-half of the test questions on a passage correctly.

X_1 = the percentage of words outside the Dale list of 3000 familiar words.

X_2 = the average sentence length in words.

Of the numerous general purpose procedures that have been developed for predicting readability, this is considered one of the most accurate (Klare, 1963). It correlates .70 with McCall and Crabbs' Standard Test Lessons in Reading (1925) and a hybrid version of it is used by JAMAL.

A second analysis was also made using the Fry Readability Graph (Fry, 1968) which uses syllables per 100 words and words per sentence to predict a direct reading grade score. The graph was developed by Fry in Uganda in the early sixties and has since been validated on reading materials used in Great Britain and the United States. Fry (1972) reported a master's thesis by A. C. Kistulentz in 1967 which showed that the Readability Graph correlated highly ($r > .95$) with the Dale-Chall, Flesch, and SRA formulas. However, unlike the Dale-Chall Formula, the Fry Graph can be used with readers as low as the

first grade level and it is comparatively bias-free with respect to dialectal differences.

Readability analyses using both procedures were made of randomly selected passages of approximately 100 words each from both the primary and supplementary readers for each level of instruction. An analysis of variance of the mean readability of the Level 2-4 primary readers was then made to test whether they were significantly different in readability. The Level 1 primary reader, due to its brevity, was descriptively analyzed. The number of passages that were needed from Levels 2-4 to provide power equal to .80 to detect estimated differences of at least .70 standard deviations of the standardized population means at the .05 level of significance was approximately $\bar{N} = 25$ (or approximately $\bar{n} = 8$ passages per level).

The Dale-Chall Formula and Fry Graph corresponded quite closely in direction as shown in Table 1, although the latter yielded measures that were somewhat more variable. Both procedures also similarly showed a lack of correspondence between the primary and supplementary readers. Although the readability of the primary readers was generally in the direction that was expected, the readability of the supplementary readers was ostensibly out of step with the intended level of instruction. However, in northern Trelawny Parish the supplementary readers are often used only in the instructional program as optional reading and, in some instances, are not required reading until Level 4. In view of this, the analysis of variance of readability was restricted to the primary readers.

Table 1
Means and Standard Deviations of Readability Scores
of JAMAL Readers

Reader	Level 1			Level 2			Level 3			Level 4		
	\bar{n}	\bar{M}	\overline{SD}	\bar{n}	\bar{M}	\overline{SD}	\bar{n}	\bar{M}	\overline{SD}	\bar{n}	\bar{M}	\overline{SD}
Dale-Chall Formula												
Primary	3	3.94	.02	5	3.93	.03	10	4.33	.15	10	4.74	.59
Supplementary	-	----	---	8	5.54	.68	8	4.08	.45	8	5.40	.48
Fry Graph												
Primary	3	1.00	0	5	1.00	0	10	1.40	.70	10	3.55	1.38
Supplementary	-	----	-	8	5.00	2.56	8	2.25	1.04	8	3.69	.88

Cochran's test of equal variances was made to determine whether parametric analysis of variance could be used with unequal n. The assumption of homogeneous variances was not sustained for either the Dale-Chall or Fry Graph scores. A procedure described by Kirk (1968) which consists of determining the ratio of the largest to the smallest score in each level using several common transformations suggested the possibility of achieving equal variances with a logarithmic transformation. The transformed scores yielded $\underline{C} = .9050$, $\underline{df} = 3/7$, $p < .01$ for the Dale-Chall formula; and $\underline{C} = .5714$, $\underline{df} = 3/7$, $p < .05$ for the Fry Graph. Although the variability was reduced somewhat, it was considered prudent to use the Kruskal-Wallis nonparametric analog of analysis of variance. In addition to being a distribution-free test, it has an asymptotic efficiency of 95.5% relative to parametric analysis of variance (see Siegel, 1956).

Table 2

Kruskal-Wallis Analysis of Variance of Readability Scores
of Primary Readers
(Levels 2-4)

Readability Predictor	<u>df</u>	χ^2	χ^2 corrected
Dale-Chall Formula	2	18.366	18.366*
Fry Graph	2	15.149	17.252*

* $p < .001$

The results of the Kruskal-Wallis analysis of variance presented in Table 2 indicated that the readability of the primary readers was significantly different among levels beyond the .001 level. Nemenyi's test was used to determine which pairwise comparisons were significant. This procedure, which was developed by P. Nemenyi in a doctoral dissertation in 1963, is based on the Kruskal-Wallis test and is described by Kirk (1968).

Table 3

Nemenyi's Multiple Comparison Test of Readability
Mean Rank Differences of Primary Readers

Readability Predictor/ Instructional Level Mean Rank	Level 2	Level 3	Level 4	dKW
Dale-Chall Formula				
2 = 3.00	----	8.20	16.80*	9.87
3 = 11.20		----	8.60*	8.06
4 = 19.80			----	
Fry Graph				
2 = 6.50	----	2.85	13.40*	9.87
3 = 9.35		----	10.55*	8.06
4 = 19.90			----	

* $p < .05$

The results of Nemenyi's test, which are presented in Table 3, indicated that there were significant differences in readability beyond the .05 level between Levels 4 and 2 and

between Levels 4 and 3, but not between Levels 3 and 2. The results were the same for both the Dale-Chall and Fry Graph scores. Nevertheless, the differences were sufficiently in the direction that was expected to support student months per level of instruction as a useful measure of achievement.

CHAPTER III

RESULTS

Achievement

Means and standard deviations of student months per level of instruction are presented in Table 4 by class setting and student sex. The group means are 14.34, 16.82, and 21.36 for private homes, churches, and primary schools respectively; and 17.05 and 17.96 for male and female students respectively. A total of $N = 150$ observations were obtained yielding $n = 25$ observations per cell.

Table 4

Means and Standard Deviations of Student Months per Level of Instruction by Class Setting and Student Sex

Class Setting	Males		Females	
	M	SD	M	SD
Private Homes	13.84	6.54	14.84	7.59
Churches	18.04	8.99	15.60	9.97
Primary Schools	19.28	7.99	23.44	8.01

Note. $N = 150$ (cell $n = 25$).

The analysis of variance presented in Table 5 revealed that the mean differences among class settings were significant

beyond the .001 level ($F = 9.305$, $df = 2/144$). Differences associated with student sex and the interaction of student sex and class setting, however, were not significant.

Table 5

Analysis of Variance of Student Months per Level
of Instruction by Class Setting and Student Sex

Source	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>
Class setting (A)	1267.375	2	633.688	9.305*
Student sex (B)	30.828	1	30.828	.453
A X B	272.410	2	136.205	2.000
W. cell	9806.883	144	68.103	
Total	11377.490	149		

* $p < .001$

Although the analysis of variance had adequate power to detect estimated differences associated with student sex of .25 standard deviations of the standardized population means, Table 6 revealed that it had only a 47% probability of detecting differences of this size associated with the interaction of student sex and class setting. However, it is also evident from Table 6 that if a significant interaction effect, and in particular a significant student sex effect, exists in the population, it is not likely to be substantial.

With regard to the source of the overall significance of the differences among class settings, Duncan's multiple range

Table 6
Power Estimates of Analysis of Variance of
Student Months per Level of Instruction
at the .05 Level of Significance

Effect	Effect Size	
	.25	.40
Class setting (A)	.79	.99
Student sex (B)	.86	.995
A X B	.47	.87

Table 7
Duncan's Multiple Range Test of Mean Student Months
per Level of Instruction Among Class Settings

Means	Private Homes (A ₁)	Churches (A ₂)	Primary Schools (A ₃)	Shortest Significant Range
A ₁ = 14.34	----	2.48	7.02*	R ₂ = 3.23
A ₂ = 16.82		----	4.54*	R ₃ = 3.41
A ₃ = 21.36			----	

* $p < .05$

test was used to determine which pairwise comparisons were significant. The results of this analysis, which are presented in Table 7, revealed that mean months per level of instruction in primary school and private home classes and primary school and church classes were significantly different from each other beyond the .05 level. Mean differences between private home and church classes, however, were not significant.

The proportion of variance (omega-square) in student months per level of instruction accounted for by class setting was .099. An analysis of variance of class months per level of instruction, however, revealed virtually no relationship. The means and standard deviations were 15.05 ± 9.12 , 16.31 ± 9.96 , and 17.23 ± 8.55 for private homes, churches, and primary schools respectively; and Cochran's test indicated that there was no significant intergroup variability ($\chi^2 = .3884$, $df = 3/5$, $p > .05$). Although the class means were in the same direction as the student means, they were not significantly different ($F < 1.0$, $df = 2/14$), and the proportion of variance accounted for by class setting was inconsequential. However, the power of the test was only approximately .20 with respect to detecting an effect size of .099 omega-square, and consequently the results of the test of class means must be regarded as inconclusive.

The next phase of the analysis of student months per level of instruction consisted of evaluating and, if necessary, statistically controlling the effects of intersetting differences in student placement level, student rate of attendance, teacher

educational level, and class hours per week of instruction. The regression of the dependent variable on each of these variables was computed and tested for interaction to determine whether the individual within-group r 's could be pooled to obtain an average within-setting correlation. The magnitude of the coefficient was then evaluated to determine whether covariate adjustment was warranted.

Interaction was tested at the relatively stringent .01 level of significance in view of an empirical study by Peckham in 1968 (described in Glass, Peckham, & Sanders, 1972) which revealed that heterogeneous slopes (i.e. interaction) had little effect on the analysis of covariance with respect to Type I error except when the differences were extreme. In this instance, the test tended to be conservative. Under these circumstances, the risk of bias was considered preferable to the alternative of possibly having to reject some concomitant variables from covariate analysis because the within-group slopes were not homogeneous at the .20 or .25 levels of significance, which are sometimes used as criteria.

Tests of interaction and regression coefficients for the four concomitant variables are presented in Table 8. No significant interactions were detected and, with the exception of class hours per week of instruction, the within-setting correlations were negligible. Differences in student placement level, student rate of attendance, and teacher educational level were either unrelated to student months per level of instruction or were largely homogeneous among class settings.

Table 8
Regression Coefficients for Student Months
per Level of Instruction

Concomitant Variable ^a	Slope	Correlation	<u>t</u> ^b
Student Placement Level ($\underline{F} = 1.68$, $p > .10$)			
Between Settings	17.59	.95	
Within Settings	.15	.01	.168
Total	.88	.08	.948
Student Rate of Attendance ($\underline{F} = 2.72$, $p > .05$)			
Between Settings	-20.92	-.71	
Within Settings	-1.65	-.09	-1.061
Total	-2.59	-.13	-1.628
Teacher Educational Level ($\underline{F} = 1.05$, $p > .20$)			
Between Settings	-1.62	-.22	
Within Settings	1.06	.14	1.737
Total	.74	.10	1.226
Class Hours per Week of Instruction ($\underline{F} = 4.27$, $p > .01$)			
Between Settings	-2.12	-.22	
Within Settings	-5.07	-.29	-3.695*
Total	-4.21	-.27	-3.438*

^aTests of interaction are in parentheses.

^bTwo-tailed test.

* $p < .001$

Class hours per week of instruction, on the other hand, was both moderately and significantly related to the dependent variable within settings ($r = -.29$, $p < .001$), and was consequently selected for covariate adjustment.

The results of the analysis of covariance presented in Table 9 were generally similar to the preceeding analysis of variance. Differences among class settings were significant beyond the .001 level ($F = 10.213$, $df = 2/143$), while differences associated with student sex and the interaction of student sex and class setting were not significant.

Table 9

Analysis of Covariance of Student Months per Level
of Instruction by Class Setting and Student Sex

Source	SS	df	MS	F
Class setting (A)	1284.207	2	642.104	10.213*
Student sex (B)	57.109	1	57.109	.908
A X B	196.305	2	98.152	1.561
W. cell	8990.617	143	62.871	
Total	10528.238	148		

Note. The covariate is class hours per week of instruction.

* $p < .001$

Covariate adjustment, however, did produce a shift in the relative proximity of the various class setting means as shown in Table 10. Although mean student months per level of instruction

continued to be lowest in private home classes and highest in primary school classes, church class means moved in proximity from the former to the latter. Duncan's multiple range test revealed significant differences beyond the .05 level between primary school and private home classes and between church and private home classes, but not between church and primary school classes.

Table 10

Duncan's Multiple Range Test of Adjusted Mean
Student Months per Level of Instruction
Among Class Settings

Adjusted Means	Private Homes (A ₁)	Churches (A ₂)	Primary Schools (A ₃)	Shortest Significant Range
A ₁ = 13.36	----	5.62	6.82*	R ₂ = 3.11
A ₂ = 18.98		----	1.20	R ₃ = 3.27
A ₃ = 20.18			----	

* $p < .05$

The proportion of variance in student months per level of instruction accounted for by class setting, however, was nearly the same in the analysis of covariance as in the preceding analysis of variance: .109 compared to .099.

Attendance

Rates of student attendance are presented in Table 11 by

class setting, student sex, and student placement level. The group percentage rates are 77.08, 79.17, and 54.17 for private homes, churches, and primary schools respectively; 73.61 and 66.67 for male and female students respectively; and 58.33 and 81.94 for low placement level students (Level 1) and intermediate and high placement level students (Levels 2-4) respectively. A total of $N = 144$ observations were obtained yielding $n = 12$ observations per cell.

Table 11
Rates of Student Attendance by Class Setting,
Student Sex, and Placement Level

Class Setting	Males		Females	
	Level 1	Level 2-4	Level 1	Level 2-4
Private Homes	.6667	.8333	.7500	.8333
Churches	.7500	1.0000	.5833	.8333
Primary Schools	.5000	.6667	.2500	.7500

Note. $N = 144$ (cell $n = 12$).

The analysis of variance presented in Table 12 revealed that student attendance was significantly different among class settings and between placement level categories beyond the .01 level ($F = 4.838$, $df = 2/132$ for class settings; and $F = 10.508$, $df = 1/132$ for student placement levels). However, differences associated with student sex and both the first and second order interactions were not significant.

Table 12
 Analysis of Variance of Student Attendance
 by Class Setting, Student Sex,
 and Student Placement Level

Source	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>
Class setting (A)	1.847	2	.924	4.838*
Student sex (B)	.174	1	.174	.911
Placement level (C)	2.007	1	2.007	10.508*
A X B	.264	2	.132	.691
A X C	.264	2	.132	.691
B X C	.063	1	.063	.330
A X B X C	.292	2	.146	.764
W. cell	25.249	132	.191	
Total	30.160	143		

* $p < .01$

Rates of student attendance by class setting, student sex and teacher sex are presented in Table 13. The group percentage rates are 67.49 and 70.08 in classes supervised by male and female teachers respectively, and are otherwise similar to Table 11 with respect to class setting and student sex. In this design only $N = 120$ observations could be obtained due to the inclusion of teacher sex as a level of classification and the necessity of controlling student placement level differences. In order to accomplish the latter and obtain both the maximum number of observations and the advantage of using a conventional

analysis of variance, equal cell ratios of Level 1 and Level 2-4 enrollees were observed, yielding proportional cell n 's.

Table 13
Rates of Student Attendance by Class Setting,
Student Sex, and Teacher Sex

Class Setting	Male Students		Female Students	
	Male Teachers	Female Teachers	Male Teachers	Female Teachers
Private Homes	.8750	.6667	.5000	1.0000
Churches	.7500	.9167	.6250	.8333
Primary Schools	.6250	.5000	.6250	.4167

Note. $N = 120$, proportional cell n .

The analysis of variance presented in Table 14 also revealed that student attendance was significantly different among class settings, but only beyond the .05 level in this case. Apparently this was due to random error variation between the samples. Differences associated with student sex were also not significant, and neither were differences associated with teacher sex, nor differences associated with the first and second order interactions.

Selective power estimates of the two preceding analyses of variance are presented in Table 15. Power was adequate to detect main effects and first order interaction effects of .40 standard deviations of the standardized population means, but

Table 14
 Analysis of Variance of Student Attendance
 by Class Setting, Student Sex,
 and Teacher Sex

Source	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>
Class setting (A)	1.800	2	.900	4.369*
Student sex (B)	.086	1	.086	.417
Teacher sex (C)	.009	1	.009	.044
A X B	.035	2	.018	.087
A X C	.700	2	.350	1.699
B X C	.122	1	.122	.592
A X B X C	.632	2	.316	1.534
W. cell	22.208	108	.206	
Total	25.592	119		

* $p < .05$

Table 15
Power Estimates of Analysis of Variance
of Student Attendance at the
.05 Level of Significance

Effect	Effect Size	
	.25	.40
Class setting, Table 12 (A)	.77	.99
Student sex, Table 12 (B)	.85	.995
Placement level, Table 12 (C ₁)	.85	.995
Teacher sex, Table 14 (C ₂)	.79	.99
A X B	.45	.86
A X C ₁	.45	.86
A X C ₂	.28	.78
B X C ₁	.56	.92
B X C ₂	.49	.87
A X B X C ₁	.23	.53
A X B X C ₂	.20	.45

provided only a 45-53% probability of detecting second order interaction effects of this size. Power was also adequate to detect main effects of .25 standard deviations of the standardized population means, but provided 45% or less probability of detecting both first and second order interaction effects of this size. It is reasonable to assume that if differences associated with student sex and teacher sex exist, they are likely to be small; and that if differences associated with the interaction of each of these variables with class setting exist, they may be moderate to small in size. However, with respect to the interaction of both student sex and teacher sex with class setting, the test was inconclusive.

With regard to the source of the differences among class settings indicated by both analyses of variance, the results of Duncan's multiple range test presented in Table 16 revealed that the following pairwise comparisons were significant beyond the .05 level: primary school and private home classes, and primary school and church classes. There were no significant differences in either case, however, between private home and church classes.

The average proportion of variance (omega-square) in rates of student attendance accounted for by class setting in both analyses of variance was .051. The proportion of variance accounted for by student sex was .060.

The population proportion of variance (eta-square) in class rates of attendance accounted for by class setting was .059. The class percentage rates of attendance, which were

Table 16

Duncan's Multiple Range Tests of Rates of Student Attendance
Among Class Settings

Proportions, Table 11	Primary Schools (A ₃)	Private Homes (A ₁)	Churches (A ₂)	Shortest Significant Range
A ₃ = .5417	-----	.2291	.2500	R ₂ = .1767
A ₁ = .7708		-----	.0209	R ₃ = .1861
A ₂ = .7917			-----	
Proportions, Table 13	Primary Schools (A ₃)	Churches (A ₂)	Private Homes (A ₁)	Shortest Significant Range ^a
A ₃ = .5450	-----	.2475*	.2492*	R ₂ = .2117
A ₂ = .7925		-----	.0017	R ₃ = .2230
A ₁ = .7942			-----	

^aComputed with the harmonic group mean, $\bar{n} = 36$.

* $p < .05$

similar to the student percentage rates, were 75.80, 70.70, and 64.71 for private homes, churches, and primary schools respectively.

CHAPTER IV

DISCUSSION

Conclusions

The results of the analyses of student means supported the rejection of both principal null hypotheses. Student months per level of instruction and student attendance were both found to be differentially related to class setting, and the differences among the various class settings generally varied in the same direction on both dependent variables. In addition, the results generally concurred with the underlying assumption of the research that adult students respond more favorably to literacy classes held in distinctly adult settings than classes held in settings suggestive of teaching children.

With regard to student months per level of instruction, the analysis of variance and the subsequent analysis of covariance both revealed that adult students attending literacy classes held in private homes advanced more rapidly in level of instruction than students attending literacy classes held in primary schools. In terms of the strength of association between the variables, class setting accounted for nearly 10% of the variance in student months per level of instruction, and nearly 11% after intersetting differences in class hours per week of instruction were controlled. However, it should

be noted that confounding sources of variance which the research design may have failed to control, as well as error in the instruments underlying the measurement of the dependent variable, undoubtedly attenuated these estimates. Consequently, the true population proportion of variance may have been underestimated. Replication of the research and subsequent improvements in the research design and instrument reliability can help clarify the matter.

Although there was no significant interaction between class setting and student sex, power analysis revealed that any differences that may have existed in the population were not likely to have been very large. In other words, differences in student months per level of instruction among class settings may have been largely independent of differences in student sex.

With regard to rates of student attendance, literacy classes held in private homes and, in this instance, churches appeared to be more efficacious than literacy classes held in primary schools. However, class setting accounted for only about 5% of the variance in the dependent variable. The true population proportion of variance, of course, may have been underestimated for the same reasons that were cited with regard to the relationship between class setting and student months per level of instruction.

No significant interactions were found between class setting and student sex, student placement level, and teacher sex or higher order interactions of these variables. Power

analysis, however, revealed that any interaction effects that may have existed in the population, with the exception of higher order interactions, were not likely to have been very large. Consequently, differences in rates of student attendance among class settings were probably independent to a large extent of differences in student sex, student placement level, and teacher sex individually.

The results of the analyses of class means also tended to support the relationship between class setting and the dependent variables and the direction of the relationship, although the results in one instance were statistically inconclusive. With regard to class months per level of instruction, the analysis of variance had insufficient power to detect population differences among class settings and no significant differences were found. Nevertheless, the observed differences were in the same direction as the differences in student months per level of instruction. With regard to rates of class attendance, population data were available, and hence statistical inference and power were not an issue. The descriptive analysis of rates of class attendance revealed that differences among settings were in the same direction as the sample differences in rates of student attendance. Class setting also accounted for nearly the same proportion of variance in rates of class attendance (5.9%) as in rates of student attendance (5.1%).

Recommendations for Planning

The results of the research have implications for program planning in northern Trelawny Parish. Private homes or churches should preferably be sought as venues for literacy instruction in towns and villages that do not have any classes. This is not intended to imply that primary school settings should be omitted from program planning. The results of one study are not sufficient to warrant such action. Until further research is done, efforts should probably be made to provide a variety of settings in more towns and villages. At the time the field research was completed, only 4 of the 40 towns and villages in the area that had literacy classes provided students a choice between classes held in private homes or churches and classes held in primary schools. In addition, there was a disproportionate use of primary schools and churches relative to private homes.

There were more than 8,450 dwellings in northern Trelawny Parish including approximately 7,000 separate houses (1970 census). The majority of dwellings consisted of one or two rooms which may not have been suitable for holding literacy classes. Nevertheless, there were more than 2,700 dwellings of three or more rooms which might have served the purpose. Although JAMAL classes held in private homes accounted for nearly 45% of the number of evening classes in the research population, they accounted for only 1% of the number of dwellings of three or more rooms in the area.

There were approximately 64 churches in the area. Although

complete denominational lists of the number of churches were unavailable in some instances, current data on the number of parishioners were available from CADEC (Christian Action for Development in the Caribbean), the research branch of the Caribbean Council of Churches. In those instances where the number of churches was not known, trend-line analysis of the regression between the known number of parishioners and churches in the area was used to estimate the missing data. The majority of parishioners were Baptist. Other principal sects, in order of size, were Anglican, Church of God, Methodist, Congregational and Presbyterian, Seventh Day Adventist, United Pentecostal, Brethren, Roman Catholic, and Moravian. Although JAMAL classes held in church settings accounted for 34% of the number of evening classes in the research population, they accounted for nearly 36% of the number of churches in the area.

There were 38 primary schools in the area including 17 government-sponsored basic schools, 5 infant and primary schools, and 16 all-age schools (Ministry of Education, 1975). JAMAL classes held in these settings accounted for only about 21% of the number of evening classes in the research population, but nearly 37% of the number of primary schools in the area. There were also 4 secondary/high schools in northern Trelawny Parish, but these were not used for literacy classes.

Although the use of churches and primary schools as settings for JAMAL literacy classes could be increased, the use of private homes in relatively untapped. In view of the apparent advantage of holding literacy classes in private homes, priority

should be given to soliciting more of them for the JAMAL program.

The results of the research also have implications for program evaluation in northern Trelawny Parish. The use of the mean as a criterion for evaluating student months per level of instruction and student attendance among classes may be inappropriate when comparisons are made across settings. Instead, it may be more appropriate to evaluate the relative efficacy of individual classes against the mean for classes held in the same or similar settings. For example, student months per level of instruction and student attendance in classes held in primary schools should probably be compared with the mean for classes held in primary school settings rather than with the mean for all class settings in the parish, since the effect of the latter procedure may underestimate class accomplishment. Conversely, the use of the overall mean for evaluating classes held in private homes may tend to inflate class accomplishment. The use of the within setting mean would eliminate this bias and would lead to a more accurate evaluation of the accomplishment of each class. It would be desirable, of course, if all classes could be expected to do equally well irrespective of setting, and it is the obligation of evaluation to facilitate this. However, until the differential effect among settings has been eliminated, it may be advisable to evaluate student months per level of instruction and student attendance among classes against criteria that reflect the limitations or advantages of each setting.

Recommendations for Further Research

There is a need for both direct and systematic replication of the research. The former would include replicating the study under conditions that were the same or nearly the same as those of the research. The latter would include modifying the dependent and independent variables.

Direct replication could be carried out by repeating the study in northern Trelawny Parish to determine whether the relationships that were found continue to hold over time or by conducting the study in other Jamician parishes. Fortunately, JAMAL has already expressed an interest in replicating the study on an island-wide basis. This would be invaluable in verifying the results of the research and would immediately contribute to program planning.

Systematic replication carried out in other field settings using different dependent variables and settings would also be invaluable. The choice of settings, however, should serve two purposes: (a) to maximize the variance between settings and (b) to contribute to a fuller understanding of the theory upon which the research was based. In the first case, it is unlikely that there would be any point, at least at this stage, in exploring the relationship between student attendance, for example, and several types of settings that were functionally similar such as houses and apartments. In the second case, research on the differential effects of various class settings should attempt to extend the theory regarding the relationship between setting and the performance of adult students.

The research studied two aspects of student behavior, achievement and attendance, in relation to different class settings, but additional research is needed to explain why the behavior occurred. In this respect, valuable research could be conducted by assessing student attitudes toward various settings as well as changes in student self-concept and reading habits. Various instruments which have been developed for measuring these characteristics could provide additional theoretical insights into the effect of various settings.

It cannot be emphasized enough that replication of the research, and particularly research on student attitudes, could profit immeasurably by employing designs that comprehensively reflect the problem. Considerable insight could be obtained by using multiple partial correlation techniques and factorial designs which account for as much extraneous variance as possible. For example, although one phase of the present research explored the partial correlation between student months per level of instruction and class setting controlling for intersetting differences in class hours per week of instruction, this model could be extended, if necessary, to control for village differences or student differences in attitude, age, and socioeconomic status. These factors could be controlled either through partial correlation (i.e. covariate analysis), or, depending on the objectives of the research, by incorporation into a factorial design.

In addition, an effort should especially be made in further

research to control confounding effects that may result from student self-selection. A theoretically simple, but administratively difficult, design that would accomplish this would be to randomly assign enrollees to the various class settings being investigated. In the event that this could not be done, a practical alternative would be to compare student performance in towns and villages that had only one type of setting (such as private homes, churches, or primary schools) with student performance in towns and villages that offered a choice of settings. This would eliminate to some extent the rival hypothesis that differences associated with the settings were attributable to factors other than the unique effect of the settings.

The research provided evidence that there is a need to continue to explore the relationship between adult literacy class settings and student performance, and that further studies of this kind may have both theoretical and practical significance.

APPENDIX A
CLASS DATA RECORD

CLASS DATA RECORD

DATE OF RECORD _____

General Information

Name of teacher in charge of class _____ Total number of teachers in class _____

Address of class _____ Town _____

Class Setting

Tick where class meets:

Private Church
Home _____ Hall _____ School _____ Other (specify) _____Class Schedule

Tick when class meets and five times:

Sun	_____	Mon	_____	Tues	_____	Wed	_____	Thurs	_____	Fri	_____	Sat	_____
From	_____		_____		_____		_____		_____		_____		_____
To	_____		_____		_____		_____		_____		_____		_____

Student Enrollment and Attendance

Number of students currently enrolled _____

Number of students regularly attending _____

APPENDIX B

SUPPLEMENTARY CLASS DATA RECORD

SUPPLEMENTARY CLASS DATA RECORD

DATE OF RECORD _____

General Information

Name of teacher in charge of class _____ Years of Schooling Completed _____

Address of Class _____ Town _____

Student Information

Class Roll Number	Sex: Male Female	Number of Months Enrolled	Level of Instruction at Enrollment	Level of Instruction at Present	Regularly Attending: Yes No
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1					
2					
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35					

APPENDIX C

JAMAL ADULT LITERACY EDUCATION TESTS

ADULT LITERACY EDUCATION

TEST I

INSTRUCTIONAL SHEET

This test should be done with each student orally. It consists of A, B, and C. The student should do all three sections.

Two sheets are provided: Sheet 1 for the Examiner, Sheet 2 for the student.

SECTION A

The student should call the words on his sheet (2) while the Examiner uses Sheet 1 and puts a tick (✓) if correct or an X if incorrect in the appropriate column under "Result."

SECTION B

Let the student read the sentences on Sheet 2. The Examiner on his sheet (1) will underline each word not known by the student.

SECTION C

The Examiner will ask the student to read these and state the

answer. If the student is unable to do so, read them to him and record the answers.

TOTAL MARKS:- 100

Section A	10 words, 3 marks each	= 30
Section B	3 sentences, 10 marks each	= 30
Section C	4 questions, 10 marks each	= 40

ADULT LITERACY EDUCATIONTEST ISHEET 1EXAMINER ONLY

Student's Name:-

Age:-

Institution:-

SECTION A

<u>WORDS</u>	<u>RESULT</u>
LOOK	_____
BOY	_____
AND	_____
MAN	_____
TO	_____
THE	_____
BOOK	_____
FOR	_____
SEE	_____
COME	_____

SECTION B

The man is here.

I will be at home.

This is my book.

ADULT LITERACY EDUCATIONTEST ISHEET 2FOR STUDENTS

Student's Name:-

Age:-

Institution:-

SECTION A

LOOK	THE
BOY	BOOK
AND	FOR
MAN	SEE
TO	COME

SECTION B

THE MAN IS HERE.

I WILL BE AT HOME.

THIS IS MY BOOK.

SECTION C

1. Take 9¢ from 20¢.
2. $\$1.60 + 50¢$.
3. How many pints are in 1 quart of milk?
4. 12 eggs make 1 dozen.
How many make $1\frac{1}{2}$ dozens?

ADULT LITERACY EDUCATIONTEST IIINSTRUCTIONAL SHEET

This test consists of Sections A, B, C, and D. The student should attempt all four sections. Two sheets are provided: Sheet 1 for the Examiner, Sheet 2 for the student.

SECTION A

Testing for this section should be done with each student orally. The student should call the words on his sheet (2) while the Examiner uses Sheet 1 and puts a tick (✓) if correct or an X if incorrect in the appropriate column under "Result."

SECTION B

The student should read and fill in the blanks to make complete sentences. If the student is unable to read, assist him.

SECTION C

Explain to the student that he is to rewrite the sentences on the lines provided, putting in capital letters and full stops.

SECTION D

Assist the student if he is unable to read the questions.

TOTAL MARKS:- 100

Section A	10 words, 2 marks each	= 20
Section B	4 sentences, 5 marks each	= 20
Section C	3 sentences, 10 marks each	= 30
Section D	5 questions, 6 marks each	= 30

ADULT LITERACY EDUCATIONTEST IISHEET 1EXAMINER ONLY

Student's Name:-

Age:-

Institution:-

SECTION A

<u>WORDS</u>	<u>RESULT</u>
MONEY	_____
PLACE	_____
JOB	_____
WASH	_____
CLOTHES	_____
HOUSE	_____
LAND	_____
POLICE	_____
PAY	_____
HEAD	_____

ADULT LITERACY EDUCATIONTEST IISHEET 2FOR STUDENTS

Student's Name:-

Age:-

Institution:-

SECTION A

MONEY	HOUSE
PLACE	LAND
JOB	POLICE
WASH	PAY
CLOTHES	HEAD

SECTION B

Put a word in each space to make a sentence:-

1. She goes to the _____.
2. We _____ good food.
3. It is a _____ day.
4. Mother _____ the cake.

SECTION C

Rewrite these sentences putting in capital letters and full stops:-

1. my father came home this morning
2. i have a friend named john

SHEET 2 (Continued)

3. the boy went to kingston on monday

SECTION D

1. How many groups of 5 can I get out of 45? _____
2. Take 45¢ from \$1.00. _____
3. Share 4 cakes equally among 8 people. How many would each get? _____
4. I have 3 dozen corns. How many more will I need to make 45?

5. How many 5¢ are in 60¢? _____

ADULT LITERACY EDUCATIONTEST III

Student's Name:-

45 minutes

Age:-

Institution:-

SECTION A

20 marks, 5 marks each.

Underline the two words in each line that mean the same, e.g.
see, run, chat, look, talk.

1. START STOP BEGIN WALK SIT
2. QUITE LARGE TINY NOISY BIG
3. SING SAY REPLY ASK ANSWER
4. BEG TAKE GIVE BARROW ASK

SECTION B

25 marks, 5 marks each.

Read the following sentences and state whether they are true or false by underlining one:-

1. The water is blue in colour. (True of False)
2. The Jamaican flag is green, gold and black. (True of False)
3. Mr. Brown is Tim's grandfather, therefore, Tim is Mr. Brown's grandson. (True or False)
4. There are always 28 days in February. (True or False)
5. Morant Bay is the capital of St. Thomas. (True or False)

SECTION C

30 marks, 5 marks each.

Give the opposite of these words:-

WORDSOPPOSITE

MORE

HEAVY

FULL

NARROW

HUSBAND

SHARP

SECTION D

25 marks, 5 marks each.

1. Find the sum of 6, 60, 600 and 66. _____
2. How many days are there altogether in January, June and November? _____
3. $(5 \times 7) + 30 =$ _____
4. The sum of two numbers is 63. One is 29, what is the other? _____
5. Divide 679 by 7. _____

ADULT LITERACY EDUCATIONTEST IVENGLISH LANGUAGE

Student's Name:-

Age:-

Institution:-

45 minutes - Do all questions.

SECTION A

40 marks

You have just had a birthday and someone sent you a present which you liked. Write a letter thanking him/her for it.

SECTION B

30 marks

Comprehension:-

There was once a tailor called Pinn,
Who only made suits for the thin,
He stood on the mat,
To keep out the fat,
But let the slim people come in.

Answer these questions:-

1. What was the tailor's name?
2. What sort of people did he allow in his shop?
3. Why did he stand on the mat?
4. List the words that rhyme.
5. What was Mr. Pinn's occupation?

SECTION C

30 marks

Rewrite these sentences and change the underlined words to words opposite in meaning:-

1. The door was closed but I could hear everything.
2. The highest branches were loaded with ripe fruits.
3. The teachers answer many questions.
4. Summer is hot.

ADULT LITERACY EDUCATIONTEST IVARITHMETIC

45 minutes - Do all questions

100 marks - 10 marks each.

1. Of a class of 32 boys, $\frac{3}{8}$ were late. How many boys were early?
2. $\frac{N}{3} = 5$, find the value of N.
3. Take 3 times 60¢ from 4 times \$1.20.
4. How much is 4 times and a half of \$5.00?
5. The product of two numbers is 87. One is 29. What is the other?
6. If I spent 5¢ per day for sweets during the month of March, how much did I spend?
7. What number should be divided by 9 to get 7?
8. How many ninths are in $7\frac{5}{9}$?
9. Write seven thousand and seven in figures.
10. How many 5¢ stamps can I buy with \$1.20?

APPENDIX D
JAMAL READING MATERIAL

JAMAL Reading Material

The JAMAL primary readers were originally prepared by the Social Development Commission between 1953 and 1972, and with few subsequent revisions continue to be used in the present literacy program. A Teacher's Guide and student workbooks accompany the readers for Levels 1-3 and manuals are being prepared for Level 4. All of the readers are illustrated and printed in a reader type face ranging from 18 point type in the initial readers to 14 point type in subsequent readers. A brief description of the readers is presented below:

Level 1. Our Class and Our Family. 36 pp., 15.50 x 20.75 cm.

The reader contains 21 reading exercises designed to introduce the student to 34 sight words and simple sentences constructed from these words. The accompanying workbook is divided into 10 lessons designed to teach the student the alphabet, numbers, and rudimentary writing skills.

Level 2. A Day with the Sharpes. 60 pp., 18.75 x 14.25 cm.

The reader contains a short narrative, followed by 28 reading exercises. The student is introduced to 78 additional sight words and receives instruction in phonics. The workbook is divided into 16 lessons which provide the student with additional practice in phonics and writing.

Level 3. Henry Sharpe. 48 pp., 19 x 14 cm.

The reader is written entirely in narrative accompanied by intensive instruction in phonics. The workbook is

divided into 20 lessons which include comprehension, writing, and crossword puzzle exercises.

Level 4. Henry Learns to Drive. 44 pp., 21.50 x 16.50 cm.

The reader is written entirely in narrative and includes dialog in West Indian dialect.

Two phonics books are also used in Levels 2-4, and a free monthly newspaper, Let's Read, containing articles written at each level, is distributed to classes.

Other materials, prepared between 1974 and 1975 for supplementary use at different levels, reflect the practical concerns of many illiterates, as some of the following titles indicate: Plan to Get Married?-Steps to Take, How to Register a Child, Foods Our Bodies Need, Our Civic Duties, Guide to Learner Drivers, and Drainage and Irrigation.

REFERENCES

- Abernathy, E. A. The effect of changed environmental conditions upon the results of college examinations. Journal of Psychology, 1940, 10, 293-301.
- América en cifras 1972, situación cultural: Educación y otros aspectos culturales. Washington, D.C.: Organización de los Estados Americanos, Instituto Interamericano de Estadística, 1973.
- Benét, W., Uquillas, J., & Renner, R. Illiteracy in Latin America: Recent trends and issues. Literacy Work, 1975, 4(4), 43-68.
- Bilodeau, J. M., & Schlosberg, H. Similarity in stimulating conditions as a variable in retroactive inhibition. Journal of Experimental Psychology, 1959, 41, 199-204.
- Boshier, R. The use and development of a dropout predictor scale. Adult Education, 1972, 22, 87-99.
- Boshier, R. Educational participation and dropout: A theoretical model. Adult Education, 1973, 23, 255-282.
- Brembeck, C. S. Program of studies in non-formal education: Strategic uses of formal and non-formal education. April 1972. (ERIC No. ED 079 197).
- Cohen, J. Statistical power analysis for the behavioral sciences. New York: Academic Press, 1969.
- Combs, A. W. A perceptual view of the adequate personality. In Association for Supervision and Curriculum Development 1962 Yearbook Committee (Ed.), Perceiving, behaving, becoming. Washington, D.C.: National Education Association, 1962.
- Dale, E., & Chall, J. S. A formula for predicting readability. Educational Research Bulletin, 1948, 27, 11-20; 37-54.
- Dixon, W. J. (Ed.). BMD biomedical computer programs (3rd ed.). Los Angeles: University of California Press, 1973.
- Fletcher, H. J. Possible interpretive problems in analyses using group means as the experimental unit. Psychological Bulletin, 1968, 69, 157-160.

- Fox, R. S. The social environment and the learning situation. In C. T. Larson (Ed.), School environments research 2: Environmental evaluations. Ann Arbor: University of Michigan, College of Architecture and Design, 1965.
- Fox, R. S., Lippitt, R. O., & Schmuck, R. A. Pupil teacher adjustment and mutual adaptation in creating classroom learning environments. Ann Arbor: University of Michigan, Institute for Social Research, 1964.
- Frankel, M. R. Inference from survey samples: An empirical investigation. Ann Arbor: University of Michigan, Institute for Social Research, 1971.
- Fry, E. B. A readability formula that saves time. Journal of Reading, 1968, 11, 513-516; 575-578.
- Fry, E. B. Reading instruction for classroom and clinic. New York: McGraw-Hill, 1972.
- Galat-Noumer, J. Colombia: Un gigantesco centro educativo. Revista Javeriana, 1969, 72, 298-307.
- Gale, L. Education and development in Latin America. New York: Praeger, 1969.
- Gammon, M. Non-formal learning--Jamaica's experience in mass literacy. Kingston, Jamaica: JAMAL Foundation, August, 1975.
- Glass, G. V., Peckham, P. D., & Sanders, J. R. Consequences of failure to meet the assumptions underlying the fixed effects analyses of variance and covariance. Review of Educational Research, 1972, 42, 237-288.
- Haase, R. F., & DiMattia, D. J. The effect of environment and personality on counseling outcomes. Washington, D.C.: National Center for Educational Research and Development, December 1972. (ERIC No. ED 083 510).
- Hall, E. T. The hidden dimension. New York: Anchor Press, 1966.
- Harris, D. M. Creating adult basic education programs. Paper presented at the National Right to Read Training Conference, Glassboro State College, Glassboro, N.J., 1972. (ERIC No. ED 070 904).
- Hart, E. Acción de la OEA en el campo educativo: Conferencias y publicaciones, 1889-1965. La Educación, July-December 1965, pp. 72-102.

- Jamaica population census, 1970. Kingston, Jamaica: Department of Statistics, 1973-1974.
- JAMAL Foundation. Objectives of adult learner behaviour. Kingston, Jamaica: Author, April 1973.
- JAMAL Foundation. Progress report. Kingston, Jamaica: Author, March 1975.
- Jensen, G., & Schrader, A. Socialization. Review of Educational Research, 1965, 35, 201-207.
- Kirk, R. E. Experimental design: Procedures for the behavioral sciences. Belmont, Calif.: Brooks/Cole, 1968.
- Klare, G. R. The measurement of readability. Ames: Iowa State University Press, 1963.
- Knowles, M. The adult learner: A neglected species. Houston: Gulf Publishing Company, 1973.
- Larson, C. T. (Ed.). School environments research 1: Environmental abstracts. Ann Arbor: University of Michigan, College of Architecture and Design, 1965. (a)
- Larson, C. T. (Ed.). School environments research 2: Environmental evaluations. Ann Arbor: University of Michigan, College of Architecture and Design, 1965. (b)
- Lewin, K. Field theory in social science. New York: Harper & Row, 1951.
- Lunney, G. H. Using analysis of variance with a dichotomous dependent variable: An empirical study. Journal of Educational Measurement, 1970, 7, 263-269.
- Manley, D. R. A national programme to eradicate illiteracy (Ministry Paper No. 13). Kingston, Jamaica: Ministry of Youth and Community Development, June 6, 1972.
- Marquardt, W. F., & Cortright, R. W. Review of contemporary research on literacy and adult education in Latin America. Latin American Research Review, 1968, 3(3), 47-69.
- Maslow, A. H. Motivation and personality. New York: Harper Brothers, 1954.
- Maslow, A. H., & Mintz, N. L. Effects of esthetic surroundings: Initial effects of three esthetic conditions upon perceiving "energy" and "well being" in faces. Journal of Psychology, 1956, 41, 247-254.

- McCall, W. A., & Crabbs, L. M. Standard test lessons in reading. New York: Columbia University, Teachers College, 1925.
- McClusky, H. Y. Psychology and learning. Review of Educational Research, 1965, 35, 191-197.
- McVey, G. F. Sensory factors in the school learning environment (Series No. 35). Washington, D.C.: National Education Association, 1971. (ERIC No. ED 060 507).
- Michelson, W. Physical environment as a mediating factor in school achievement. Paper presented at the Annual Meeting of the Canadian Sociology and Anthropology Association, Calgary, Alberta, June 1968. (ERIC No. 046 496).
- Ministry of Education school directory, 75-76. Kingston, Jamaica: Ministry of Education, Educational Planning Unit, 1975.
- National Literacy Board. The National Literacy Programme. Kingston, Jamaica: Author, March 1974.
- Nicholson, E., & Otto, W. A. A study of dropouts from adult literacy programs. In G. B. Schick & M. M. May (Eds.), Junior college and adult reading programs--Expanding fields (16th Yearbook). Milwaukee: National Reading Conference, 1967.
- Peckham, P. D., Glass, G. V., & Hopkins, K. D. The experimental unit in statistical analysis. Journal of Special Education, 1969, 3, 337-349.
- Rogers, C. R. Some observations on the organization of personality. American Psychologist, 1947, 2, 358-368.
- Siegel, S. Nonparametric statistics. New York: McGraw-Hill, 1956.
- Snedecor, G., & Cochran, W. Statistical methods (6th ed.). Ames: Iowa State University Press, 1967.
- Sommer, R. Personal space: The behavioral basis of design. Englewood Cliffs, N.J.: Prentice-Hall, 1969.
- Statistical yearbook of Jamaica, 1974. Kingston, Jamaica: Department of Statistics, 1975.
- Thomas, D. G., & Wright, B. E. (Eds.). Learning environments. Chicago: University of Chicago Press, 1975.

- Thornberg, H. D. Attitudinal determinants in holding dropouts in school. Journal of Educational Research, 1975, 68, 181-185.
- Thorndike, R. L., & Hagen, E. Measurement and evaluation in psychology and education. New York: John Wiley, 1955.
- Travers, R. M. W. Essentials of learning. New York: MacMillan, 1963.
- UNESCO. Suggestions for research in adult literacy: Meeting of experts on research in literacy. Paris: Author, July 1968.
- UNESCO. Experimental world literacy programme: Experimentation in functional literacy pilot projects. Paris: Author, 1970.
- UNESCO. Statistical yearbook, 1971. Paris: Author, 1972.
- University of Wisconsin. Effects of facilities on educational achievement: A selected bibliography. Madison, Wisc.: ERIC Clearinghouse on Educational Facilities, 1970. (ERIC No. ED 041 379).
- White, S. Physical criteria for adult learning environments. Washington, D.C.: Adult Education Association of the U.S.A., Commission on Planning Adult Learning Systems, Facilities, and Environments, October 1972. (ERIC No. ED 080 882).

BIOGRAPHICAL SKETCH

William Benét was born May 23, 1948, in St. Augustine, Florida. He attended elementary and secondary school in St. Augustine and graduated from St. Joseph's Academy in 1966. He then attended the University of Florida, Gainesville, where he received a Bachelor of Arts degree in English in 1971. During this time he married Janis Pauline Dilgren and studied Spanish at the University of the Americas, Mexico.

In 1973 the author obtained a Master of Education degree in English from the University of Florida. He then pursued doctoral studies in curriculum and instruction, which included a specialization in reading education and a minor in research foundations of education.

The author has taught English at Key West High School, Key West, Florida, and served as a graduate assistant and academic counselor at the Reading and Study Skills Center, University of Florida. During his dissertation field research in Jamaica, West Indies, he was an Organization of American States Research Fellow and an interim measurement coordinator for the Jamaican Movement for the Advancement of Literacy (JAMAL) Foundation.

The author is a member of the American Educational Research Association, the International Reading Association, Phi Delta Kappa, and Kappa Delta Pi. He is also the co-author of a

review of trends and issues in adult literacy education in Latin America commissioned by the International Institute for Adult Literacy Methods.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



H. T. Fillmer, Chairman
Professor of Curriculum and
Instruction

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



Ruthellen Crews
Professor of Curriculum and
Instruction

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Janet J. Larsen
Associate Professor of English

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



Richard R. Renner
Professor of Foundations of
Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



Robert S. Soar
Professor of Foundations of
Education


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Chester E. Tillman
Associate Professor of English

This dissertation was submitted to the Graduate Faculty of the College of Education and to the Graduate Council, and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

June, 1977



B. Sherrill Gay
Dean, College of Education

Dean, Graduate School